GEFRAN

2308

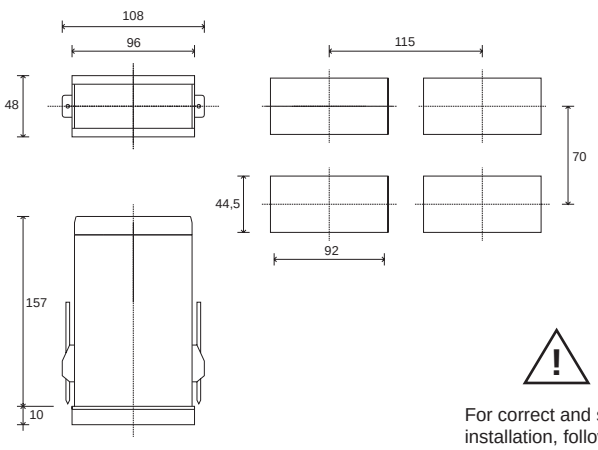
MULTIZONE INDICATOR / ALARM UNIT

USER'S MANUAL

SOFTWARE VERSION **4.x**
code **80330B** / Edition **08** - **06/09**

1 • INSTALLATION

• Dimensions and cut-out; panel mounting



For correct and safe installation, follow the instructions and observe the warnings contained in this manual.

Panel mounting:
To fix the unit, insert the brackets provided into the seats on either side of the case. To mount two or more units side by side, respect the cut-out dimensions shown in the drawing.

2 • TECHNICAL SPECIFICATIONS

Resolution	4000 pt
Accuracy	0.2% f.s. ±1 digit for linear inputs 0.5% f.s. ±1 digit for TC, RTD, mVac inputs
Acquisition speed	160msec per channel
Thermocouples	J, K, S, R, T
Resistance Thermometer	RTD Pt100 2-wires RTD Pt100 3-wires
Power supply	100...240Vac/dc ±10% 11...27Vac/dc ±10% 50/60Hz, 10VA
Relay output	NC/NO selectable with jumpers (5A/220Vac cosφ = 1) (1,5A cosφ = 0,2)
Logic output	25V/15mA max
Protections	- "Watch-dog" protection circuit for instrument reset in case of interference - 3 SW protection levels - jumper to enable access to calibration from panel keys
Work temperature	0...50°C
Function	8-bit microprocessor

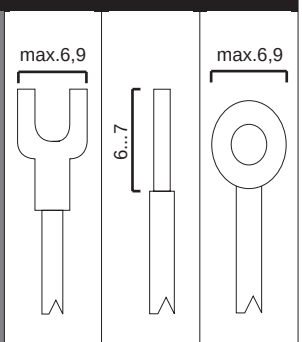
***CE MARKING*:** The instrument conforms to the European Directives 2004/108/CE and 2006/95/CE with reference to the generic standards: **EN 61000-6-2** (immunity in industrial environment) **EN 61000-6-3** (emission in residential environment) **EN 61010-1** (safety).
***MAINTENANCE*:** Repairs must be done only by trained and specialized personnel. Cut power to the device before accessing internal parts.
Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene, etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.
***SERVICE*:** GEFRAN has a service department. The warranty excludes defects caused by any use not conforming to these instructions

EMC conformity has been tested with the following connections

FUNCTION	CABLE TYPE	LENGTH
Power supply cable	1 mm²	1 m
Relay output cable	1 mm²	3,5 m
Digital communication wires	0,35 mm²	3,5 m
TC input	0,8 mm² compensated	5 m
Pt100 input	1 mm²	3 m

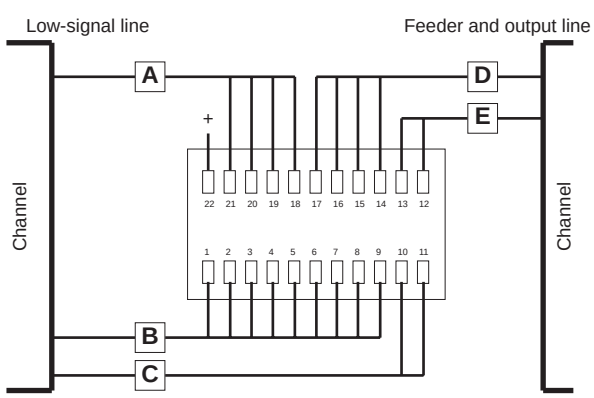
3 • TERMINALS

STANDARD VERSION WITH SCREW TERMINAL



With fork terminal;
with tinned wire;
with ring terminal

4 • SUGGESTED CONNECTIONS



A SERIAL
B INPUTS
C MD81 EXPANSION
D OUTPUTS /RELAYS
E FEED

5 • DESCRIPTION OF FACEPLATE

Auxiliary display
Indication of displayed channel

REM serial communication signals, configuration for 8 inputs 100mVac

"Calibration" button
Gives access to various steps of instrument calibration procedure

Plate showing units of measurement

Signal: alarms 1 and 2 relays energized

Main display
Displays the variables for the 8 channels

Function button
Used to select the various channels when the instrument operates in manual and to end the configuration and calibration procedures at any time

"Configuration" button
Gives access to various steps of normal (alarm setting) and complete calibration procedure for the instrument

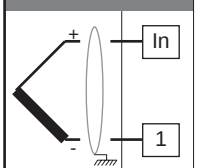
"Raise" and "Lower" buttons
Lets you raise (lower) any numerical value or choice of optional. •• Raising (lowering) speed is proportional to duration of pressing time. •• The procedure is not cyclical; i.e., once the maximum (minimum) value for the setting is reached, the raise (lower) function is blocked even if the button remains pushed.

"Man/Auto" channel scan button
Switches operation from manual to automatic and vice versa. In manual, channel scanning is done with the "Function" button. In automatic (decimal point of auxiliary display ON), scanning is automatic. •• Press the key at any point of the configuration procedures to display the software version. Small display: "U"; Large display: n version. This display persists until the key is pressed again.

6 • CONNECTIONS

• Inputs (See HW configuration)

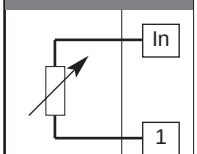
• TC



Available thermocouples:
J, K, S, R,T

- Observe polarities
- For extensions, use the correct compensating cable for the type of TC used

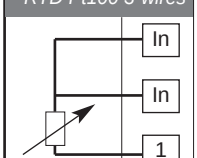
• RTD Pt100 2-wires



Use wires of adequate diameter (min. 1,5mm²)

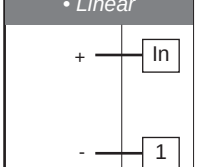
NOTES:
For a 15m cable with 1.5 mm² section, the error is approximately 1°C.

• RTD Pt100 3-wires



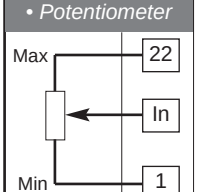
Use wires of adequate diameter (min. 1 mm²)
The 3-wire resistors take up 2 inputs: the actual input must be odd (1-3-5-7), and the next channel, even, for the third wire.

• Linear



Scale in direct voltage
0…20, 0…50, 0…10 mV, 0…10V
Scale in direct current
0…20, 4…20 mA

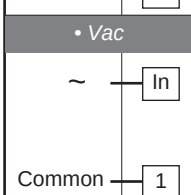
• Potentiometer



Potentiometer ≥ 1KOhm

With 10V power only (reference to S6 Power jumper)

• Vac



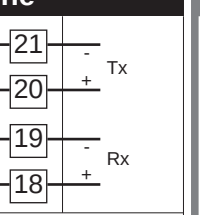
0...100mVac

ATTENTION:
all 8 inputs must be in mVac

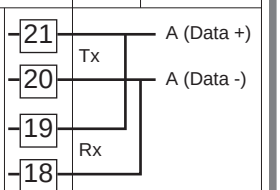
• Serial line

Connection
Parallel Current Loop

Resistance in series to the diode is 1KΩ; in series to the transistor collector is 100Ω

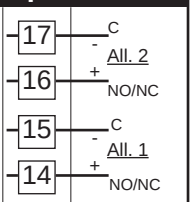


Connection
RS485



• Alarm outputs

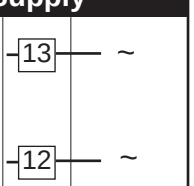
Contact capacity
5A/220Vac
For logic output
24V/15Ma

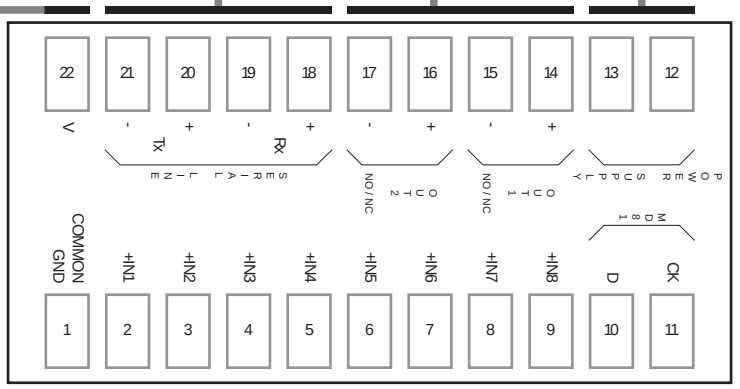


• Power Supply

Standard:
100...240Vac/dc ±10%

Optional:
11...27Vac/dc ±10%



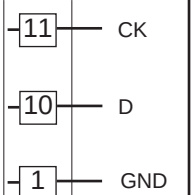


INPUTS

1	GND
2	Channel 1 input
3	Channel 2 input
4	Channel 3 input
5	Channel 4 input
6	Channel 5 input
7	Channel 6 input
8	Channel 7 input
9	Channel 7 input

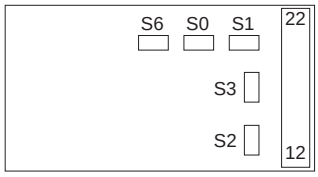
• MD81 (see paragraph 10)

The MD81 unit must be placed near the instrument (max 20cm)



7 • HARDWARE CONFIGURATION

Power board



Sensor / transmitter power (fastons 1-22)

S6 15V

S6 10V

Alarm 1 (fastons 14-15)

S2 NO Contact

S2 NC Contact

Digital communication connection (Rx)

S1 Parallel connection

S1 Serial connection

Alarm 2 (faston 16-17)

S3 NC Contact

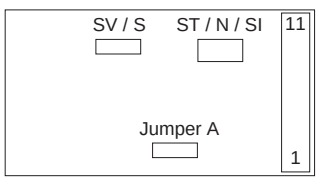
S3 NO Contact

Terminal 22 polarization

S0 Terminal 22 = positive sensor feed (A)

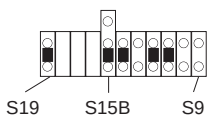
S0 Terminal 22 = negative sensor feed (B)

CPU board

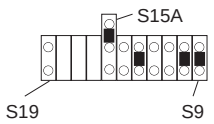


JUMPER A

TC, RTD, Vdc, Pot.. mA Inputs



Vac Inputs



Temperature (°F - °C)

S18 °C

S18 °F

Access to calibration

S17 Disabled

S17 Enabled

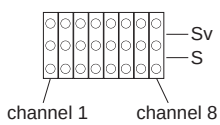
Serial line preset for Parallel / Serial connection (TX)

S16 Serial connection

S16 Parallel connection

JUMPER SV/S

Input type: single channel

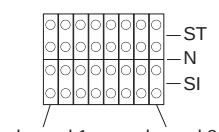


Sx TC; RTD; mV; mA; Vac

SVx Potenz.; 0...10Vdc

JUMPER ST / N / SI

Input type: single channel



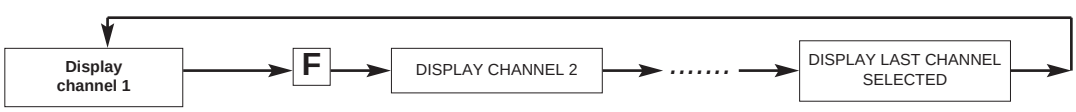
STx TC

Nx Vac/Vdc; RTD; Pot.

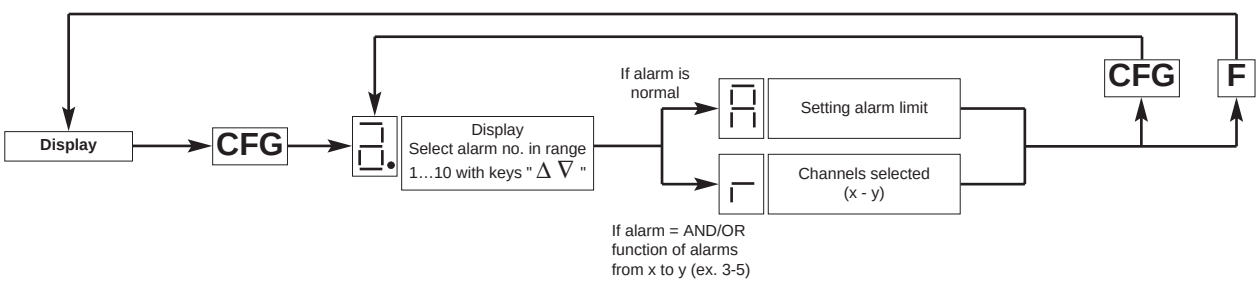
SIx 0...20mA 4...20mA

8 • SOFTWARE CONFIGURATION

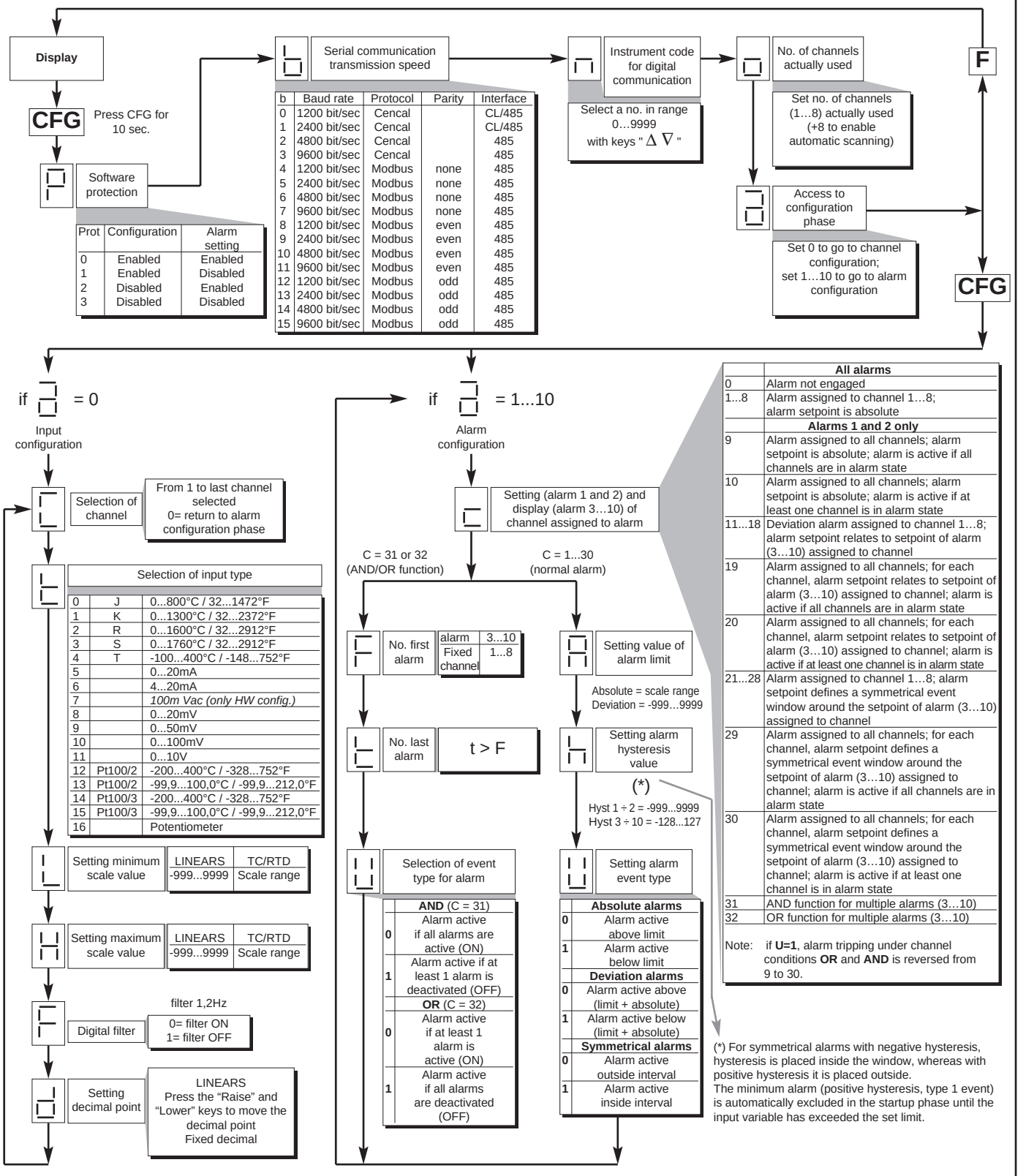
8a • Display



8b • Alarm setting



8c • Configuration


Display
CFG
Press CFG for 10 sec.
Software protection
Serial communication transmission speed
Instrument code for digital communication
Select a no. in range 0…9999 with keys " Δ ∇ "
No. of channels actually used
Set no. of channels (1…8) actually used (+8 to enable automatic scanning)
Access to configuration phase
Set 0 to go to channel configuration; set 1…10 to go to alarm configuration
F
CFG
if = 0
Input configuration
Selection of channel
From 1 to last channel selected 0= return to alarm configuration phase
Selection of input type
Setting minimum scale value
Setting maximum scale value
Digital filter
filter 1,2Hz
0= filter ON 1= filter OFF
Setting decimal point
LINEARS Press the "Raise" and "Lower" keys to move the decimal point Fixed decimal
if = 1...10
Alarm configuration
Setting (alarm 1 and 2) and display (alarm 3…10) of channel assigned to alarm
C = 31 or 32 (AND/OR function)
C = 1...30 (normal alarm)
No. first alarm
No. last alarm
t > F
Selection of event type for alarm
Setting value of alarm limit
Absolute = scale range
Deviation = -999…9999
Setting alarm hysteresis value
(*)
Hyst 1 ÷ 2 = -999...9999
Hyst 3 ÷ 10 = -128...127
Setting alarm event type
All alarms
Alarms 1 and 2 only
Note: if U=1, alarm tripping under channel conditions OR and AND is reversed from 9 to 30.
(*) For symmetrical alarms with negative hysteresis, hysteresis is placed inside the window, whereas with positive hysteresis it is placed outside.
The minimum alarm (positive hysteresis, type 1 event) is automatically excluded in the startup phase until the input variable has exceeded the set limit.

Prot	Configuration	Alarm setting
0	Enabled	Enabled
1	Enabled	Disabled
2	Disabled	Enabled
3	Disabled	Disabled

b	Baud rate	Protocol	Parity	Interface
0	1200 bit/sec	Cencal		CL/485
1	2400 bit/sec	Cencal		CL/485
2	4800 bit/sec	Cencal		485
3	9600 bit/sec	Cencal		485
4	1200 bit/sec	Modbus	none	485
5	2400 bit/sec	Modbus	none	485
6	4800 bit/sec	Modbus	none	485
7	9600 bit/sec	Modbus	none	485
8	1200 bit/sec	Modbus	even	485
9	2400 bit/sec	Modbus	even	485
10	4800 bit/sec	Modbus	even	485
11	9600 bit/sec	Modbus	even	485
12	1200 bit/sec	Modbus	odd	485
13	2400 bit/sec	Modbus	odd	485
14	4800 bit/sec	Modbus	odd	485
15	9600 bit/sec	Modbus	odd	485

0	J	0...800°C / 32...1472°F
1	K	0...1300°C / 32...2372°F
2	R	0...1600°C / 32...2912°F
3	S	0...1760°C / 32...2912°F
4	T	-100...400°C / -148...752°F
5		0...20mA
6		4...20mA
7		*100m Vac (only HW config.)*
8		0...20mV
9		0...50mV
10		0...100mV
11		0...10V
12	Pt100/2	-200...400°C / -328...752°F
13	Pt100/2	-99,9...100,0°C / -99,9...212,0°F
14	Pt100/3	-200...400°C / -328...752°F
15	Pt100/3	-99,9...100,0°C / -99,9...212,0°F
16		Potentiometer

	LINEARS	TC/RTD
Setting minimum scale value	-999...9999	Scale range
Setting maximum scale value	-999...9999	Scale range

alarm	3...10
Fixed channel	1...8

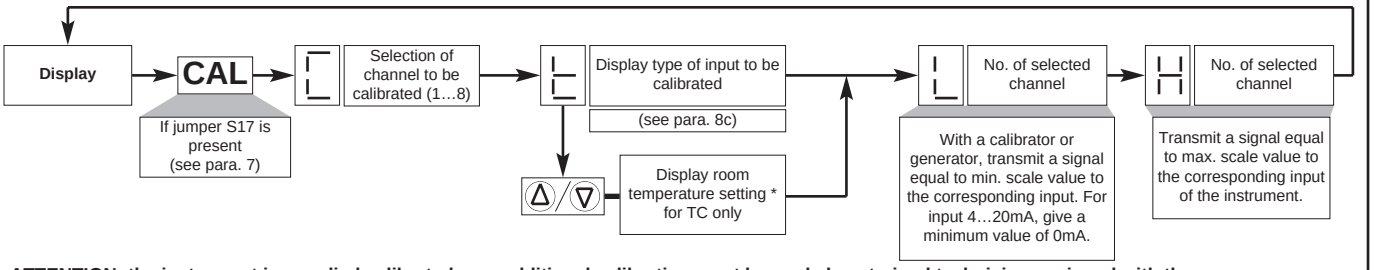
AND (C = 31)	
0	Alarm active if all alarms are active (ON)
1	Alarm active if at least 1 alarm is deactivated (OFF)
OR (C = 32)	
0	Alarm active if at least 1 alarm is active (ON)
1	Alarm active if all alarms are deactivated (OFF)

Absolute alarms	
0	Alarm active above limit
1	Alarm active below limit
Deviation alarms	
0	Alarm active above (limit + absolute)
1	Alarm active below (limit + absolute)
Symmetrical alarms	
0	Alarm active outside interval
1	Alarm active inside interval

All alarms	
0	Alarm not engaged
1...8	Alarm assigned to channel 1…8; alarm setpoint is absolute
Alarms 1 and 2 only	
9	Alarm assigned to all channels; alarm setpoint is absolute; alarm is active if all channels are in alarm state
10	Alarm assigned to all channels; alarm setpoint is absolute; alarm is active if at least one channel is in alarm state
11...18	Deviation alarm assigned to channel 1…8; alarm setpoint relates to setpoint of alarm (3…10) assigned to channel
19	Alarm assigned to all channels; for each channel, alarm setpoint relates to setpoint of alarm (3…10) assigned to channel; alarm is active if all channels are in alarm state
20	Alarm assigned to all channels; for each channel, alarm setpoint relates to setpoint of alarm (3…10) assigned to channel; alarm is active if at least one channel is in alarm state
21...28	Alarm assigned to channel 1…8; alarm setpoint defines a symmetrical event window around the setpoint of alarm (3…10) assigned to channel
29	Alarm assigned to all channels; for each channel, alarm setpoint defines a symmetrical event window around the setpoint of alarm (3…10) assigned to channel; alarm is active if all channels are in alarm state
30	Alarm assigned to all channels; for each channel, alarm setpoint defines a symmetrical event window around the setpoint of alarm (3…10) assigned to channel; alarm is active if at least one channel is in alarm state
31	AND function for multiple alarms (3…10)
32	OR function for multiple alarms (3…10)

Move from one configuration phase to another by pressing the CFG key; press the F key to go to display.

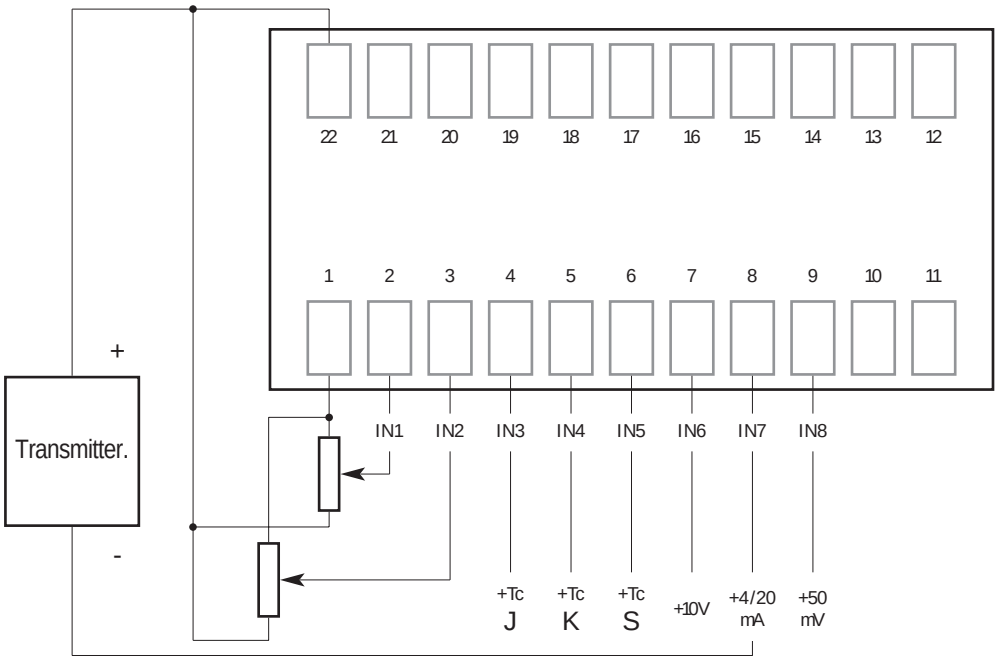
8d • Calibration


Display
CAL
If jumper S17 is present (see para. 7)
Selection of channel to be calibrated (1…8)
Display type of input to be calibrated
(see para. 8c)
Display room temperature setting * for TC only
No. of selected channel
With a calibrator or generator, transmit a signal equal to min. scale value to the corresponding input. For input 4…20mA, give a minimum value of 0mA.
No. of selected channel
Transmit a signal equal to max. scale value to the corresponding input of the instrument.

ATTENTION: the instrument is supplied calibrated; any additional calibration must be made by a trained technician equipped with the necessary devices. The procedure is irreversible.

9 • CONNECTION EXAMPLES

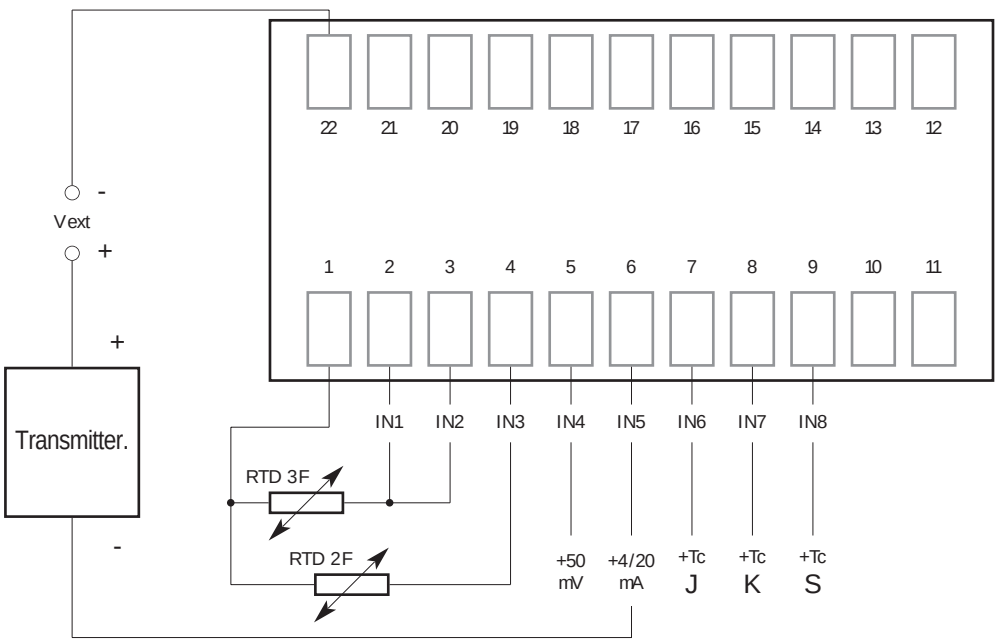
Connection examples 1



Input no.	Input type	HW configuration jumpers closed (on)	SW configuration t = input type
1	Potentiometer	SV1-N1	16
2	Potentiometer	SV2-N2	16
3	Thermocouple J	S3-ST3	0
4	Thermocouple K	S4-ST4	1
5	Thermocouple S	S5-ST5	3
6	0...10V	SV6-N6	11
7	4...20mA	S7-SI7	6
8	0...50mV	S8-N8	9

Reference for inputs in mV and TC is terminal 1
(common to all inputs) **S11 - S12 - S14 - S15B - S19 = ON**

Connection examples 2



Input no.	Input type	HW configuration jumpers closed (on)	SW configuration t = input type
1	RTD 3-wires	S1-N1	14 (15)
2	(3rd wires RTD)	S2-N2	-1
3	RTD 2-wires	S3-N3	12 (13)
4	0...50mV	S4-N4	9
5	4...20mA	S5-SI5	6
6	Thermocouple J	S6-NT6	0
7	Thermocouple K	S7-ST7	1
8	Thermocouple S	S8-ST8	3

Reference for inputs in mV and TC is terminal 1
(common to all inputs) **S11 - S12 - S14 - S15B - S19 = ON**

10 • ACCESSORIES

• MD8 - Expansion module for 8 alarm relays -

Order code

MD8 □ □ □

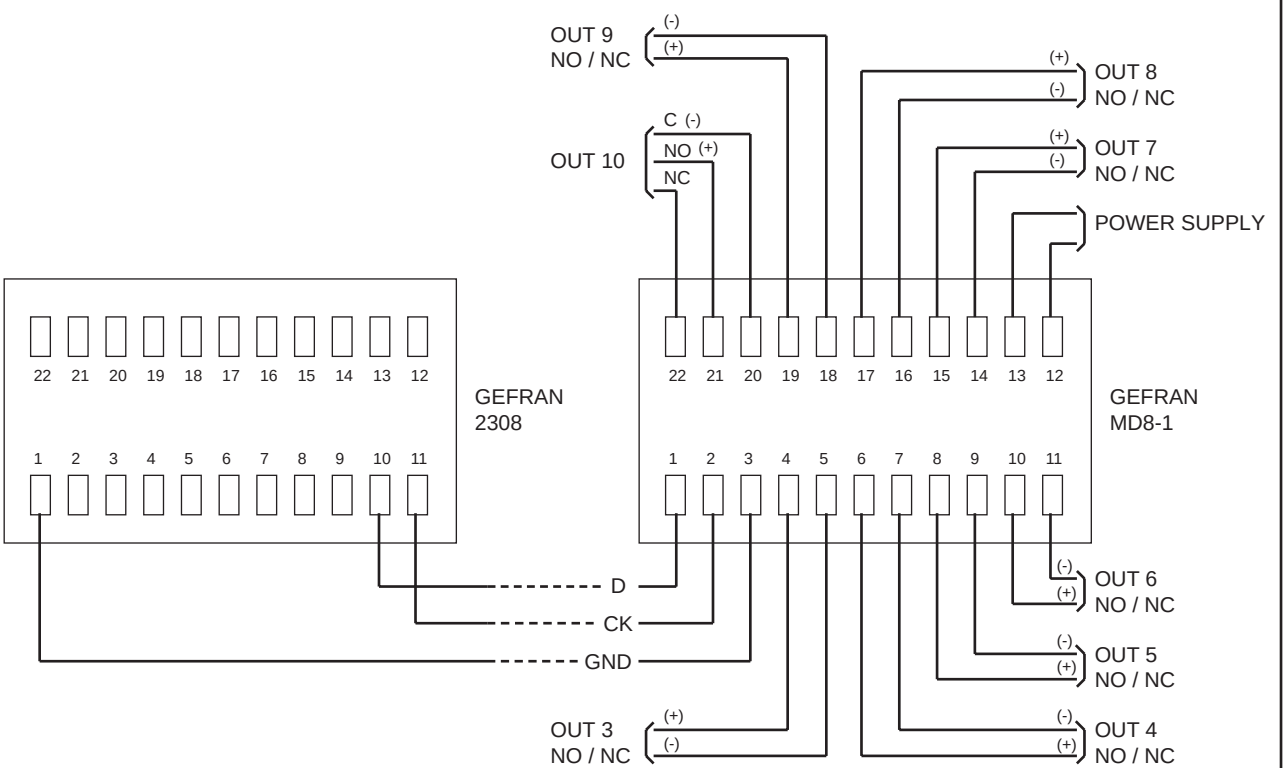
Version	
For model 2300	0
For models 3500/4500 - 2308	1

Output	
Relay	R0*
Static	D2

Power supply	
11...27Vac/dc ±10%	0
100...240Vac/dc ±10%	1

* Standard version

CONNECTIONS



TECHNICAL DATA

Signals
8 red LEDs turn on with relays energized and flash when alarm limits are set on master instrument
Red power on LED

Outputs
Relay outputs with NA or NC contact selectable with jumpers. Contact capacity 5A/220Vac to cosφ=1 (1.5A to cosφ=0.2). Protection with MOV 275V spark suppressor
Alternate: logic outputs type D2 PNP 24V/15mA max

Power supply
Standard 100...240Vac/dc - 11...27Vac/dc

Absorbed power: 4VA.
Working temperature: 0÷50°C
Case
- Policarbonato autoestinguente V0; dimensioni frontali 96x48; profondità incasso 152mm; foratura 92x45mm.
- Fissaggio a retroquadro con staffette in dotazione.
- Estraibilità frontale parte elettronica.
- Disponibilità di calotte frontali con guarnizioni fino ad un grado massimo di protezione pari a IP65.

Electrical connections
- Split terminals accept one 6.35 mm faston or two 2.8 mm fastons
- Terminals completely recessed for accident prevention

Weight: approx. 600 gr

11 • ACCESSORIES

Polycarbonate cap
Protection level **IP54**
(frame) grey / (door) transparent

For instruments size 96x96mm (1/4 DIN)
Order code **51065**

For instruments size 48x96mm (1/8 DIN)
Order code **51066**

Polycarbonate cap with rubber gasket
Protection level **IP65**
(frame) grey / (door) transparent

For instruments size 96x96mm (1/4 DIN)
Order code **51064**

For instruments size 48x96mm (1/8 DIN)
Order code **51067**

Dust-proof polycarbonate cap (transparent)

Mod. **CFA110**
48x48mm (1/16 DIN) - order code **51060**

Mod. **CFA120**
48x96mm (1/8 DIN) - order code **51061**

Mod. **CFA220**
96x96mm (1/4 DIN) - order code **51062**

Silicon rubber protection
Protection level **IP65** (transparent)

48x48mm (1/16 DIN) - order code **51183**

48x96mm (1/8 DIN) - order code **51185**

96x96mm (1/4 DIN) - order code **51186**

Instrument hole plug in self-extinguishing
polycarbonate V0 (grey)

Mod. **Q48**, for hole 45x45mm for instruments size 48x48mm (1/16 DIN) - order code **51177**
Mod. **Q94**, for hole 45x93mm for instruments size 48x96mm (1/8 DIN) - order code **51178**
Mod. **Q96**, for hole 93x93mm for instruments size 96x96mm (1/4 DIN) - order code **51179**

ORDER CODE

2308 □ □ □

DIGITAL COMMUNICATION	
Serial Current Loop	1*
Serial RS485	2

ALARM OUTPUT	
Relay	R0*
Static	D2

POWER SUPPLY	
100...240Vac/dc	1*
11...27Vac/dc	0

* Positions marked with asterisk indicate standard model

STANDARD CONFIGURATION Hardware and Software
CH1...CH8 - Thermocouple inputs J 0...800°C
Alarms - Setting 500 - Hysteresis -1 - Relay energized above set limit - NO relay contacts
Power output for 10VDC external sensor
Enable automatic channel scan
Configuration and setting enabled
Calibration disabled
Parallel connection for serial line

Please, contact GEFRAN sales people for the codes availability.

• WARNINGS

WARNING: this symbol indicates danger.
It is placed near the power supply circuit and near high-voltage relay contacts.

Read the following warnings before installing, connecting or using the device:
• follow instructions precisely when connecting the device.
• always use cables that are suitable for the voltage and current levels indicated in the technical specifications.
• the device has no ON/OFF switch: it switches on immediately when power is turned on. For safety reasons, devices permanently connected to the power supply require a two-phase disconnecting switch with proper marking. Such switch must be located near the device and must be easily reachable by the user. A single switch can control several units.
• if the device is connected to electrically NON-ISOLATED equipment (e.g. thermocouples), a grounding wire must be applied to assure that this connection is not made directly through the machine structure.
• if the device is used in applications where there is risk of injury to persons and/or damage to machines or materials, it MUST be used with auxiliary alarm units. You should be able to check the correct operation of such units during normal operation of the device.
• before using the device, the user must check that all device parameters are correctly set in order to avoid injury to persons and/or damage to property.
• the device must NOT be used in inflammable or explosive environments. It may be connected to units operating in such environments only by means of suitable interfaces in conformity to local safety regulations.
• the device contains components that are sensitive to static electrical discharges. Therefore, take appropriate precautions when handling electronic circuit boards in order to prevent permanent damage to these components.
Installation: installation category II, pollution level 2, double isolation
• power supply lines must be separated from device input and output lines; always check that the supply voltage matches the voltage indicated on the device label.
• install the instrumentation separately from the relays and power switching devices
• do not install high-power remote switches, contactors, relays, thyristor power units (particularly if “phase angle” type), motors, etc... in the same cabinet.
• avoid dust, humidity, corrosive gases and heat sources.
• do not close the ventilation holes; working temperature must be in the range of 0...50°C.
If the device has faston terminals, they must be protected and isolated; if the device has screw terminals, wires should be attached at least in pairs.
• *Power*: supplied from a disconnecting switch with fuse for the device section; path of wires from switch to devices should be as straight as possible; the same supply should not be used to power relays, contactors, solenoid valves, etc.; if the voltage waveform is strongly distorted by thyristor switching units or by electric motors, it is recommended that an isolation transformer be used only for the devices, connecting the screen to ground; it is important for the electrical system to have a good ground connection; voltage between neutral and ground must not exceed 1V and resistance must be less than 6Ohm; if the supply voltage is highly variable, use a voltage stabilizer for the device; use line filters in the vicinity of high frequency generators or arc welders; power supply lines must be separated from device input and output lines; always check that the supply voltage matches the voltage indicated on the device label.
• *Input and output connections*: external connected circuits must have double insulation; to connect analog inputs (TC, RTD) you have to: physically separate input wiring from power supply wiring, from output wiring, and from power connections; use twisted and screened cables, with screen connected to ground at only one point; to connect adjustment and alarm outputs (contactors, solenoid valves, motors, fans, etc.), install RC groups (resistor and capacitor in series) in parallel with inductive loads that work in AC *(Note: all capacitors must conform to VDE standards (class x2) and support at least 220 VAC. Resistors must be at least 2W)*; fit a 1N4007 diode in parallel with the coil of inductive loads that operate in DC.
GEFRAN spa will not be held liable for any injury to persons and/or damage to property deriving from tampering, from any incorrect or erroneous use, or from any use not conforming to the device specifications.